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## The Impact of a Large Cohort of Chinese Students on the Delivery of an Engineering Degree in the UK

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**Abstract:** Undergraduate articulation programmes are common in collaborations between China and the UK. Their proliferation has resulted in a high ratio of Chinese students in some Engineering courses. This paper interrogates such a site where a '2+2' agreement between a Chinese and British university has produced engineering learning contexts where Chinese students are in the majority. The paper draws upon a longitudinal ethnographic study of 50 Chinese undergraduate Engineering students, conducted over 15 months in China and the UK. In-depth interviews and participatory observations were conducted to collect data. Constructive grounded theory analytical approaches were adopted to analyse the data. Findings reveal that the Chinese students' contribution to the revenue and internationalization of the university culture has impelled the host school to start to link with the Chinese university closely at academic level. The effort in facilitating Chinese students' transition through early intervention and academic exchange has made the two teaching and learning contexts more connected. The presence of this large cohort of Chinese students also has motivated some of the academic staff to modify their teaching to adjust to students' learning. However, this kind of adjustment has caused some complaints from the other students in the class. The social disintegration and unfamiliarity amongst students at the initial stage have had a negative effect on peer learning. Structured contacts have benefited the integration of the multinational class, which has enhanced the peer learning in the class. Studying with Chinese students also enables home students to reflect on past learning experiences and this highlights a gap among secondary school, college and university education, which could be a potential obstacle to young people studying Engineering.

## Introduction

The number of Chinese students abroad has increased from only 860 in 1978 (National Bureau of Statistics of China 2008) to 179,800 in 2008 and within these 30 years, 1,391,500 went abroad to study (Ministry of Education of the People's Republic of China 2009). Britain, as one of the countries which enjoys a good reputation for the quality of its higher education, has become a preferred destination for Chinese students. In the academic year of 2007/2008, 45,355 Chinese students studied in the UK at higher education level (UKCISA 2009). They have become the largest group represented amongst international students in the UK (British Council 2008). Among these students, some come through articulation programmes with higher education institutions in China, which have become more stable sources of recruiting students for many British universities. Their proliferation has resulted in a high ratio of Chinese students in some Engineering courses. International students' participation has considerable influence in changing the teaching and learning dynamic in the classroom (Turner 2006). Against this background, an increasing proportion of literature starts to concentrate on the cross-cultural adaptation experience of Chinese students, which often suggests that these students should adjust to fit into the requirements and practices of the host university. The



research outlined in this paper aims to explore the dynamic impact of a group of Chinese students on teaching and learning practices in one British university.

## Methodology

### Data Collection

The participants (n=50) were registered in 2006 on a '2+2' articulation programme which was set up by a university in the southeast of China and a university in the north of England in two degrees: *Electrical and Electronic Engineering (EEE)* and *Communication and Electronic Engineering (CEE)*. The two universities are referred to here as Southeast China University and North Britain University to protect the confidentiality of the field setting. These students were recruited by Southeast China University through Chinese National Higher Education Entrance Examination and spent two years studying the syllabus of core modules imported from North Britain University, as well as the compulsory modules required by the Chinese Ministry of Education. They came to North Britain University in 2008 for their final two years' study where they joined a group of students who had been studying the first year of the programme at North Britain University.

In order to capture students' social meanings and ordinary activities, this study adopted ethnographic research methods to collect data in a systematic manner but without imposing meaning on participants externally through participating directly in the setting (Brewer 2000). Therefore, the researcher (Hou) went back to China in 2008 and stayed in students' accommodation. The 15-month fieldwork covered participants' last semester in China and the first academic year in the UK. Observations were conducted on lectures, seminars, workshops, labs, group work, presentations, as well as daily activities. Field notes were written either simultaneously or shortly afterwards. Research diaries were kept to reflect on the observation notes when they were still fresh. Cyber observations of students' group chat were also carried out all through the academic year. Three rounds of in-depth interviews with 16 Chinese students were conducted in the participants' native language to give them the power to express themselves without a language barrier. Transcripts were translated into English and checked by two bilingual academic staff. Participants' online blogs were analysed to obtain a comprehensive picture of their transition experience. Nine Chinese staff, eight British staff, one English student and two students from other countries were also interviewed after the first term. Students' personal tutor in China and programme leader in the UK were interviewed again at the end of the academic year.

Formal ethical approval was obtained from the school research ethics committee and data was collected in accordance with ethical guidelines. Participants gave fully informed consent before voluntarily joining the research. Participants' identities were protected and pseudonyms are used in this article.

### Data Analysis

Data was analysed using a constructivist grounded theory analytical approach (Charmaz 2006) to identify the directions for the on-going observations and the following round of interviews. 'Grounded theory methods preserve an open ended approach to studying the empirical world yet add rigor to ethnographic research by building systematic checks into both data collection and analysis (Charmaz 2006: p. 23).

The following procedure is modified from the analytic instruction of Charmaz (2006). This study has carried out three stages of data collection: students' last semester in China, within two months after their arrival in the UK and at the end of the academic year. Data were analysed at each stage to identify the direction of the following rounds of data collection.

After the first stage of data collection in China, the interviews were transcribed and read through carefully. Line-by-line open coding was conducted to identify concepts and discover the properties and dimensions in data. Memos were written to capture the fleeting ideas. Constant comparisons were carried out to compare the interview data with the data in the observation notes, research diary, and memos. Some of the categories were identified and served as the foundation for future comparisons. What is worth mentioning is that the second stage of data collection did not confined within these categories, but gave an open consideration of the holistic picture of the students' transition experience. After the second stage of data collection, data were open coded and compared with the



first stage's data and categories. Focused coding was then conducted to concentrate on the most significant codes which have been grouped into tentative categories. Conceptual categories were developed at this stage. These categories have become the focus of the next round of data collection. After the third stage of data collection, new data were open coded and focused coded as well. The conceptual categories developed at the second stage and the third stages were related to each other through the process of theoretical coding aiming to tell a coherent analytic story. Constant comparison has been conducted extensively at this stage linking the three stages of data, codes, categories and memos intimately. Theoretical sampling has been conducted at three stages to collect relevant data to refine the categories in the emerging theory, thus, the categories were saturated, sorted and diagrammed (Charmaz 2006). They were finally integrated into the emerging theory. The findings shown in this paper are in the categories of 'group transition' and 'dynamic impact'.

In the data analysis, it has been fully acknowledged that as an instrument of data collection, the researcher's personal knowledge and cultural background may influence the research. The suggestion made by Strauss and Corbin (1998: p. 43) has been followed that qualitative research should be open and be willing to listen and 'give voice' to informants, which means 'hearing what others have to say, seeing what others do, and representing them as accurately as possible'. Meanwhile the following steps have been taken to ensure the rigour and trustworthiness of the research and to provide authentic and credible findings. First, multiple data sources have been adopted. Data collected from observations, interviews, informal chatting and website information were crossed checked to see if there were any inconsistencies. Field notes were kept while concurrently observing or carrying out interviews. At the end of the day, research diaries were written to reflect and analyse the data in the notes. The field notes and research diary were also cross checked at the stage of analysing data. Member checking (Guba and Lincoln 1989) was conducted to establish credibility in the research: data collected from the observations was double checked with the students during second and third rounds of interviews; at the end of second round of interviews, main themes generated from the first round of interviews were restated and negotiated with the interviewees; after the third round of interviews, participants were shown the typescripts, interpretations and analysis of the data to get their views. To some extent, the trustworthiness of the data were safeguarded through these negotiations.

## Organizational Impact

The School of Engineering at North Britain University set up this '2+2' articulation programme with the School of Electronic and Automation Engineering at Southeast China University in 2004. By the end of September 2009, 320 students had been recruited to this programme by Southeast China University through National Higher Education Examination. Students who have successfully finished their two-year study and passed the language test will come to the UK for another two years study to get their bachelor degrees. The School of Engineering at North Britain University has not many home-based students on the two courses. As Frank, one of the staff members, mentions, *'there are numerous different avenues to try to attract more home based students onto the programme; it's just not popular at the moment'*. In the lectures observed, the Chinese students outnumber the UK students by a considerable margin. With 80% of the class being Chinese, the school values the cooperation with Chinese universities greatly not only because of the revenue made from the high tuition fee paid by them, but also the international atmosphere created by their participation in the school. As Brown and Jones (2007) argue, international students are no longer being seen as a source of income generation and as problematic, but as 'a source of cultural capital and intentional diversity, enriching the learning experience both for home students and for one another, expanding staff horizons, building a more powerful learning community and thus deepening the HE experience as a whole' (p.2). Therefore the school has expanded their visit from management level to academic level. They made an effort in a number of ways to facilitate Chinese articulation programme students' transition from China to the UK.

## Early Intervention

Literature has suggested that, international students abroad will experience culture shock, language shock and academic shock (Ryan 2005). The school in Britain cooperates with the Chinese university to minimize the initial difficulties that students might come across. The efforts that have indicated an impact include sending British staff to lecture the Chinese students when they were still in China. This helps Chinese students to become familiar with the approaches to teaching and learning and the requirements of UK education. As a Chinese student, Xiao Hua, comments,

'We have several lecturers from the UK to teach us in the first two years. Before I attended their lectures, I thought it will be very very hard. But after that, I feel their



teaching is not as difficult as I thought. I think the crucial thing is that I did pre-class study. My learning approach works. I'll continue to use it in England. Max said my English was OK for daily activities, but I need to improve my academic English. He suggested us to remember all the glossaries at the back of the English text book. I'm working on that now.'

(Xiao Hua, male, first interview)

Through interacting with British staff in China, students assess their own academic level, build up confidence and work out things they need to improve. Thus, they get better preparation for their learning abroad. Staff on the other hand will get to know students' previous learning experience.

'I give them some information about the city, university and the programme they are going to be studying, in terms of the content and how much time they have to spend on their studies, how they are assessed, and I also give them a lecture because I know the Chinese approach is different from ours. I do that to give them an idea of what our approach is. From what I gathered in China, their delivery is a bit more one-way and students sit and write and the lecturer or academic, delivers. Ours is a bit more two-way. I try to be more interactive to try and get the students more involved in what I'm doing and ask questions all the time. So that's what I did when I was in China'. (Frank, British Staff Member)

This early intervention is one of the structures of this kind of transnational articulation programmes and aims to prepare students academically, linguistically and psychologically for their further study in the UK, which have ameliorated students' transition experience (Hou, et al., forthcoming).

## Academic Exchange

Chinese staff's teaching is crucial for students' further study in the UK as well. Their teaching will cover the syllabus of the first year modules. How successfully the two teaching contexts in the two countries integrate will affect students' transition to a great extent. Every year, North Britain University invites an academic member of staff from Southeast China University for a nine-month visit. They attend lectures, workshops and seminars with students. They also exchange teaching and research experience with British counterparts. Their overseas life has enhanced their understanding of the teaching and learning context in the UK, which they will use in their future teaching in China.

Sheng lectures Electronic Machinery in China. He spent about nine months in the North Britain University in the academic year of 2007/2008. He was interviewed twice, one month before he left the UK and seven months after he went back to China.

'The participation in the class, seminar and laboratory gave me some ideas how they deliver the module. I also gave the English staff a lecture, in English obviously. They asked questions after my teaching. This is a very good opportunity to get two staff teams to understand each other better.' (Sheng, Chinese Staff Member)

When Sheng went back to China, he introduced some innovations in his teaching.

'Now, I'm trying to teach my students in English and make the class more interactive. I also encourage them to ask and answer questions in English as well. Although they felt reluctant to do that at the moment, it's still worth trying. After all, it will benefit their study in the UK and I know that very well.' (Sheng, Chinese Staff Member)

Tao, the Electronics lecturer, introduced 'Course Design' into his module. He asked students to conduct a 'two-week' design project in pairs in their last semester in China. Students were asked to design an audible and visual alarm. They needed to find information online, go over the text books, discuss with teammates, use software to draw the circuit, implement it in the lab and write a project report. Tao gave explanation why he made the innovations in his modules

'Through my visit to the UK, I found our experiments are mostly asking students to test out a result, while their experiments are research based. They ask students to work into groups to design a project, which was good.' (Tao, Chinese Staff Member)

The exchange information at staff level makes the four years teaching more coherent, which is a way of building an invisible bridge for Chinese students' transition. Teaching and learning has become



more internationalized in both universities. The transition experience of the Chinese articulation programme students and the intention to facilitate this transition have impacted on both universities, making the two teaching and learning contexts more connected.

## Teaching Impact

Zhou and Todman (2008) argue that British staff adjust their teaching to students' learning especially when comprising a big group of Chinese students on the course to provide better services to "customers" and to meet the challenge of improving teaching quality and learning outcomes. The British staff interviewed in this research have adjusted their teaching practices to facilitate the articulation programme students' learning not only based on the weak aspects of Chinese students, but also on the recognition of their strong points.

Staff identify that some Chinese students lack practical skills in the laboratory, report writing skills and presentation skills. Although they are good at line-by-line Mathematics, they are weak in interpreting the results. Thus staff who were observed in the first couple of weeks were trying to help Chinese students to make up the deficiencies. Simon explained the criteria and format of the report step by step; Eric instructed the basic practical skills with the equipment used in the laboratory; Tom put the mathematic problem into an Engineering context to encourage students to interpret the results they have got. In assessment practices, they also make great effort to provide students more formative feedback. Chinese students appreciate the help from the staff.

'Before I came, I was told that it was not easy to find staff. You need to make an appointment. But when I came here, I found the lecturers are willing to help us. They're very patient. I came across a professor on the corridor. I asked him something about the work placement. He spent more than one hour to explain it, which was very nice' (Ping Ping, Female, Chinese student)

'After I got my first report, I went to see the lecturer to clarify the comments he made on my report. He explained them one by one clearly and told me why he marked me down by one point here or two points there'. (Xiao Qiang, Male, Chinese Student)

Through the interaction, British staff gradually recognized the strength of the Chinese students as well. At the end of the term, staff gave very positive evaluation towards this group of students: hardworking, determined to succeed, committed to learning with good knowledge of Physics and Maths.

'I'm quite surprised actually, the Chinese group, just for the first report. They are much better than the English students. They had a first report; when was it? I think it was about two weeks ago, and I gave all the students a chance that if they did it two weeks earlier that I could look through it and tell them what they'd done wrong and what's going to help improve it. The Chinese students did that.. The English students thought, 'Oh well I don't need it. I'll do it myself.'

(Eric, British Staff Member)

Some lecturers notice the strengths of the Chinese students and adapt their approaches to teaching accordingly. For example, Tom, a British staff member notes:

'My teaching style changed a little bit when the Chinese students arrived because I would say that I lecture or teach slightly differently, depending on the group of students in front of me. ... If I know there are some good students in there, which is certainly the case with Chinese students, I will tend to give one or two more difficult problems or do something that will puzzle them, to make them think a bit more'.

(Tom, British Staff Member)

Students' final assessment results show that the standard of the course has been improved owing to the Chinese students' participation in it. 19 out of the 87 full-time students achieved over 70 per cent of the average score for the six modules, which is the standard of a first class award. 18 of them came from Southeast China University through the articulation programme. Through lecturing students who have studied the same modules in another university abroad, staff have noticed the difference in academic performance between the home students and the Chinese students. Some of them start to be critical more about their education system in the UK

'It's a bit like football. What you don't see when you watch a football match is, all the training that goes on. The Premiership footballers are that good because they train hard



all the time, they practise their skills and do things over and over again until they are really good. And then you see them in the match and think, "Oh, good footballers" but they had to do all this training. ... We've not quite got that right over here at the moment and I think there's not enough training'

(Tom, British Staff Member).

## Peer Impact

Apart from the impact on organizational and teaching practices, the participation of this large cohort of Chinese students has influenced the learning context of peers in the class. As the majority of the class are Chinese, it was not easy for other students to communicate with them at the initial stage.

'They are into themselves. I know they are so scared about mixing up. They want to be together, you don't get them alone or you can't get in between them. It's always safer to be with people you know. In a foreign country, you have to accept you can socialise and that's the point. You can't come to England and leave England and not make any friends.'

(Joe, International Students from Nigeria)

Some considerations made by the staff to facilitate the initial transition of Chinese students have caused some complaints from other students in the class.

'Most of the modules are continued from the first year and the Chinese students don't understand what's going on. He has to tell us past information from last year. It's very strange to me. I've got all the notes at home and I understand what's going on, but the Chinese don't. Because he just repeats the first year. That's why some English left the class.'

(Nina, International Student from Kuwait)

The language barrier at the start hindered the peer learning in the class.

'I really don't get on well, because half of the class really don't understand me. The majority of the class are Chinese. When you don't know something and you keep studying over and over and you still don't get it, you need someone to pull you through. And if you can't get your hands on the teacher then you need to find a student who can help you, and there the language barriers comes up again.'

(Joe, International Student from Nigeria)

Moving from a small class in the first year to a larger class of over 100 including part-time students, Jim, an English student, felt overwhelmed by the participation of the Chinese students.

'It's quite overwhelming. It doesn't provoke conflict; all it does is kind of keep people grouped into their little individual groups away from the bigger international community group itself. The class is noisier. When the noise starts piping up, and I'm not saying it's always the Chinese students but quite a lot of the time it is them... It's translation and stuff like that, which is understandable, yes they might struggle with some words and need to know what it means'.

(Jim, Home Student)

Staff also notice the imbalance of home students and Chinese students has made group work difficult. For the module, project design, students were asked to form into groups of five to six to conduct group work. Students chose between their own groups. Apart from one group having Joe, all the Chinese students were with their previous classmates.

'The group project is a difficult one, especially because it's such an imbalance. It would be a group of 4 or 5 students and 1 home student probably. I know in the past as well, sometimes when a UK student has been by himself in a group of Chinese students, they found it difficult because the Chinese students speak Chinese to each other and the UK student feels a bit excluded. Unfortunately, there are numerous different avenues to try to attract more home based students onto the programme, it's just not popular at the moment. For the Chinese students it's a bit unfortunate because there aren't sufficient home based students for them to be able to mix with. '

(Frank, British Staff Member).



Thus the social disintegration and unfamiliarity amongst students in this multinational class have had a negative effect on peer learning. Therefore, some staff has organized some social activities to engage all the students in the class.

'I play quite a lot of football so I arranged a few games of football against the students last year and they seemed to mix quite well. Half Chinese and half English students'.

(Eric, British Staff Member)

This kind of structured contact between host and international students can benefit international students' experience (Quintrell and Westwood 1994) and the mutual contact will also benefit the home students (Montgomery and McDowell 2004). As Jim, the English student suggests:

'That's when the ice started to break, and a lot of the students started talking and things like that. With those three turning up, they will realise that we're not evil devils that are going to kill them and we are just a group of lads. The lad that came to the match last year, Lee, his English name, I still talk to him when I see him around the University'.

(Jim, Home Student)

The integration helps peer learning in the class.

'In my group lab, all of them are Chinese, so when you do the labs together, someone asks me and I ask someone and it makes it easier' (Nina, International Student from Kuwait)

Studying with Chinese students enables Jim to reflect on his past learning experiences and this highlights a gap between high school and Engineering education at university level, a potential obstacle to young people studying Engineering. The percentage failure rate on Jim's course is high. Jim's classmates in the first year are from Ireland, Northern Ireland, Wales, Scotland, England who are coming in from college or the Foundation Degree. After the first year, a lot of them decided to leave because they did not think it was for them, or they change degrees for whatever reason, or failed the year and tried doing year one again. Jim blames it personally on the education system itself.

'Without going too much into it, there's a gap between University, college, college and school. From school to college, there's a gap in what people should be learning, and then from college to University there is a gap...there is such a big gap between what they learn in college for Maths to what they learn at University for Maths. There is a big, huge jump and that big jump puts a lot of people off, and unless they want to actually push themselves'.

(Jim, Home Student)

Studying with Chinese students, Jim found that *'their Maths is well above ours when we come in. A lot of them don't struggle with the Maths the way we do'*. He made comparisons about the learning process of two groups of students and attribute the high failure rate to the education system itself in this country, reflecting on how we should improve standards of teaching in maths in secondary schools and colleges in this country. This shows that one of the impacts of the influx of Chinese students is to enable other students to reflect on their own experience of education.

## Conclusions and Implications

This article aims to explore the dynamic impact of a large cohort of Chinese students on the delivery of an Engineering degree in the UK. Data analysed above show that their contribution to the revenue and internationalization of the university culture, has impelled the host school to link with the Chinese university at academic level. The effort in facilitating Chinese students' transition through early intervention and academic exchange has made the two teaching and learning contexts more connected. The presence of this large cohort of Chinese students also has motivated some of the academic staff to modify their teaching to adjust to their learning not only because of their weak points but strengths as well. However, this kind of adjustment has caused some complaints from the other students in the class. The social disintegration and unfamiliarity amongst students at the initial stage have had a negative effect on peer learning. Structured contacts have benefited the integration of the multinational class. Studying with Chinese students enables home students to reflect on past learning experiences and this highlights a gap among secondary school, college and university education, which could be a potential obstacle to young people studying Engineering.



This study has provided some useful implications for the policy makers and educators involved in this kind of transnational articulation programmes. The efficiency of the early interventions could be enhanced if more detailed information could be provided. It will be more helpful if British staff could go through the whole process of delivering a module from the lectures, seminars, and labs to assessment practices as well. This holistic exposure in teaching process could encourage Chinese students to be more prepared for their further study in the UK. Meanwhile, this could reduce the initial adjustment of the staff teaching in the UK which has caused the complaints from the other students in the class. The ongoing challenge of integrating the Chinese and other students through activities both academically and socially is an area worth our further study. The Engineering School at North Britain University in this study has identified it as an important issue and is trying to organize more structured social activities and inside classroom learning groups in order to improve the learning experience for all the students.

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